In the Claims:

Please amend the Claims to read as follows (a copy of the amended claims showing the additions and deletions appears at the end for the Examiner's convenience):

1. Process for the plasma sterilization of at least one object, in which:

a) the object or objects to be treated are placed in a treatment chamber at substantially atmospheric pressure;

b) one or more non-biocidal gas mixtures, at least one of which contains moisture, are introduced into this treatment chamber;

c) a plasma, producing chemical species from one of the gas mixtures, is created by generating, by means of a high-voltage supply, an electrical discharge between a high-voltage electrode and an earth electrode, these two electrodes being placed in this treatment chamber;

d) the chemical species of the plasma are carried away out of the inter-electrode region to the surface of the object or objects to be treated; and

e) the gas residues resulting from the treatment are removed from the treatment chamber.

2. Process according to Claim 1, characterized in that the

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moisture is introduced directly around the object or objects to be treated.

3. Process according to Claim 1, characterized in that the moisture is introduced near the inter-electrode region.

4. Process according to Claim 1 characterized in that the gas mixture contains at least 10% oxygen and 10% nitrogen.

5. Process according to Claim 4, characterized in that the gas mixture consists of ambient air.

6. Process according to Claim 1, characterized in that the relative humidity around the object or objects to be treated is between 50% and 100%.

7. Process according to Claim 6, characterized in that the relative humidity around the object or objects to be treated is greater than or equal to 90%.

8. Process according to Claim 1, characterized in that step b) of introducing the gas mixture or mixtures into the treatment chamber is carried out continuously or

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intermittently.

9. Process according to Claim 8, characterized in that the flow rate of the gas mixture or mixtures entering the treatment chamber is controlled.

10. Process according to Claim 1, characterized in that step c) of creating the plasma is preceded by a step of forced circulation of the gas mixture or mixtures in the treatment chamber.

11. Process according to Claim 1, characterized in that step d) of carrying away the chemical species of the plasma to the surface to be treated is accomplished by using the electrical wind created by the discharge between the two electrodes.

12. Process according to Claim 1, characterized in that step d) of carrying away the chemical species of the plasma to the surface to be treated is accomplished by creating a forced flow in the treatment chamber.

13. Device for the plasma sterilization of at least one object,

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characterized in that it comprises:

- a first gas source containing a non-biocidal gas mixture;
- at least one treatment chamber at atmospheric pressure comprising at least one sterilization region in which the object or objects to be treated are placed, this chamber furthermore including, in at least one plasma generation region separate from the sterilization region, at least two electrodes connected to a high-voltage supply in order to create a plasma, producing chemical species by generating an electrical discharge between these electrodes in the gas mixture introduced into the plasma generation region, the chemical species of the plasma being carried away out of the plasma generation region to the surface of the object or objects to be treated and the gas residues resulting from the treatment being removed to a recovery system via an outlet port of this chamber; and
- a humidifying chamber connected downstream of a second gas source in order to maintain a defined moisture content around the object or objects to be treated.

14. Device according to Claim 13, characterized in that the first and second gas sources form a single gas source.

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15. Device according to Claim 14, characterized in that the plasma generation region is connected to this single gas source via the humidifying chamber.

16. Device according to Claim 14, characterized in that the plasma generation region is connected directly to this single gas source, the sterilization region being connected to this single gas source via the humidifying chamber.

17. Device according to Claim 13, characterized in that the sterilization region is connected to the second gas source via the humidifying chamber, the plasma generation region being connected directly to the first gas source.

18. Device according to Claim 16, characterized in that it includes a second relative humidity sensor placed upstream of the sterilization region.

19. Device according to Claim 15, characterized in that it includes a first relative humidity sensor placed upstream of the plasma generation region.

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20. Device according to Claim 13, characterized in that the gas mixture contains at least 10% oxygen and 10% nitrogen.

21. Device according to Claim 20, characterized in that the gas mixture consist of ambient air.

22. Device according to Claim 21, characterized in that the ambient air is compressed before it is humidified.

23. Device according to Claim 13, characterized in that the sterilization region has a relative humidity of between 50% and 100%, advantageously greater than or equal to 90%.

24. Device according to Claim 13, characterized in that it comprises at least one electrode with a large radius of curvature and one electrode with a small radius of curvature, one being a high-voltage electrode and the other being an earth electrode.

25. Device according to Claim 24, characterized in that the electrode with a small radius of curvature is a metal electrode which may have one of the following shapes: a wire, spikes or a wire having spikes.

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26. Device according to Claim 24, characterized in that the electrode with a large radius of curvature is a metal electrode which may have one of the following shapes: a wire, a plane, or a mesh or solid cylinder.

27. Device according to Claim 25, characterized in that one or the other of the two electrodes, or both electrodes, are covered with a dielectric coating.

28. Device according to Claim 25, characterized in that the high-voltage electrode consists of a wire and in that the earth electrode consists of a mesh cylinder surrounding this wire.

29. Device according to Claim 24, characterized in that the electrodes are mounted as an array of parallel electrodes, the high-voltage electrodes being supplied in succession or simultaneously.

30. Device according to Claim 13, characterized in that the electrodes are of limited usage.

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31. Device according to Claim 13, characterized in that the high-voltage supply is provided by a low-frequency generator delivering a DC voltage, square-wave voltage or AC voltage, or a voltage pulsed over time.

32. Device according to Claim 13, characterized in that it comprises several treatment chambers, each treatment chamber having at least one plasma generation region connected, fixedly or not, to at least one sterilization region , the plasma generation regions being connected to a common central unit containing at least the first non-biocidal gas source , the humidifying chamber , the gas residues recovery system and the high-voltage supply.

33. Device according to Claim 32, characterized in that the sterilization region of the treatment chamber has a shape specially tailored to the object or objects to be sterilized so as to limit the production of chemical species necessary for sterilization and to optimize the rate of flow and the concentration of these sterilizing species around the object.

34. Device according to Claim 33, characterized in that the treatment chamber includes a case of standard shape and

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containing the plasma generation region, the sterilization region being formed by a removable support especially tailored to the object or objects to be treated and housed in this case.

35. Device according to Claim 32, characterized in that the sterilization region includes propagation regions of small cross section making it possible to accelerate the chemical species emanating from the plasma generation region towards various parts of the object or objects to be treated.

36. Device according to Claim 32, characterized in that the plasma generation region is incorporated into the object to be treated and forms a part thereof.

37. Device according to Claim 32, characterized in that the sterilization region is separate from the plasma generation region and forms an independent chamber.

38. Device according to Claim 32, characterized in that one or more of the treatment or sterilization chambers constitute reusable autonomous packaging, in the form of a

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transportation case, allowing the sterile post-treatment state to be maintained.

39. Device according to Claim 32, characterized in that one or more of the treatment or sterilization chambers constitute disposable packaging, in the form of a flexible bag, it being possible for the sterilization region to be divided into several separate regions after the treatment, by cutting and concomitantly sealing defined parts of this bag.

40. Device according to Claim 32, characterized in that all or part of the device is placed in a Faraday cage.

41. Device according to Claim 32, characterized in that the common central control unit includes indicating and control means which are associated with each sterilization chamber in order for the sterilization of the objects that it contains to be controlled individually.

42. Device according to Claim 41, characterized in that the common central control unit includes printing means for printing a label on which will be printed, for each sterilization chamber connected to this central control unit,

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an identification number specific to each chamber together with the date of the treatment and the parameters of the stabilization cycle carried out.

43. Device according to Claim 32, characterized in that the treatment or sterilization chamber is provided with an electronic label which makes it possible, by means of a corresponding reader of the central control unit, to determine automatically the flow rate setpoint values and control current which are suitable for the object or objects to be treated and to calculate the time needed to sterilize these objects.

44. Device according to Claim 43, characterized in that the electronic label includes a velocity sensor for measuring the flow rate of the chemical species of the plasma in the chamber.

45. Device according to Claim 43, characterized in that the electronic label includes a chemical measurement sensor.

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46. Application of the device of Claim 13 to the sterilization of objects of any shape and of any nature, especially be they metallic, composite or heat-sensitive.

47. Application of the device of Claim 13 to the sterilization of the surfaces of packaging, of products or of production equipment.

48. Application of the device of Claim 13 to the decontamination of the internal surfaces of air conditioning systems.

49. Application of the device of Claim 13 to the disinfection of containment or transfer areas.

Please add the following new claims 50-57:

50. Process according to Claim 2 characterized in that the gas mixture contains at least 10% oxygen and 10% nitrogen.

51. Process according to Claim 3 characterized in that the gas mixture contains at least 10% oxygen and 10% nitrogen.

52. Device according to Claim 17, characterized in that:

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it includes a second relative humidity sensor placed upstream of the sterilization region;

the gas mixture contains at least 10% oxygen and 10% nitrogen;

the gas mixture consist of ambient air;

the ambient air is compressed before it is humidified;

the sterilization region has a relative humidity of between 50% and 100%, advantageously greater than or equal to 90%;

it comprises at least one electrode with a large radius of curvature and one electrode with a small radius of curvature, one being a high-voltage electrode and the other being an earth electrode;

one electrode with a small or large radius of curvature is a metal electrode which may have one of the following shapes: a wire, spikes or a wire having spikes, a plane, or a mesh or solid cylinder;

either one or the other of the two electrodes, or both electrodes, are covered with a dielectric coating, or the high-voltage electrode consists of a wire and in that the earth electrode consists of a mesh cylinder surrounding this wire;

the electrodes are of limited usage;

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the high-voltage supply is provided by a low-frequency generator delivering a DC voltage, square-wave voltage or AC voltage, or a voltage pulsed over time.

53. Device according to Claim 17, characterized in that it includes a first relative humidity sensor placed upstream of the plasma generation region.

54. Device according to Claim 34, characterized in that the sterilization region includes propagation regions of small cross section making it possible to accelerate the chemical species emanating from the plasma generation region towards various parts of the object or objects to be treated.

55. Device according to Claim 37, characterized in that:

one or more of the treatment or sterilization chambers constitute either reusable autonomous packaging, in the form of a transportation case, allowing the sterile post-treatment state to be maintained, or disposable packaging, in the form of a flexible bag, it being possible for the sterilization region to be divided into several separate regions after the treatment, by cutting and concomitantly sealing defined parts of this bag;

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all or part of the device is placed in a Faraday cage.

56. Application of the device of Claim 45 to the sterilization of objects of any shape and of any nature, especially be they metallic, composite or heat-sensitive, or the sterilization of the surfaces of packaging, of products or of production equipment.

57. Application of the device of Claim 45 to the decontamination of the internal surfaces of air conditioning systems or the disinfection of containment or transfer areas.

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